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ACACIA MEDIA TECHNOLOGIES CORPORATION

UNITED STATES DISTRICT COURT

DISTRICT OF CALIFORNIA

SOUTHERN DIVISION

ACACIA MEDIA TECHNOLOGIES CORPORATION, Plaintiff, vs. NEW DESTINY INTERNET GROUP, INC., et al. Defendants. AND ALL RELATED CASE ACTIONS.	Case No. SA CV 02-1040 JW (MLGx) **Consolidated Cases:** SA CV 02-1048 JW (MLGx) SA CV 02-1063 JW (MLGx) SA CV 02-1165 JW (MLGx) SA CV 03-0218 JW (MLGx) SA CV 03-0219 JW (MLGx) SA CV 03-0259 JW (MLGx) SA CV 03-0271 JW (MLGx) SA CV 03-0308 JW (MLGx) **Related Cases:** SA CV 03-1801 JW (MLGx) SA CV 03-1803 JW (MLGx) SA CV 03-1804 JW (MLGx) SA CV 03-1807 JW (MLGx) **DECLARATION OF PETER ALEXANDER IN SUPPORT OF ACACIA' OPPOSITION TO MOTION FOR SUMMARY JUDGMENT** Hearing Date: December 2, 2004 Hearing Time: 9:00 a.m. Courtroom: 9C, 9th Floor Honorable James Ware

INTRODUCTION

I, Peter Alexander, declare as follows:

1. Unless as otherwise stated herein, I make the statements below based on my own personal knowledge, and, if called as a witness to testify regarding these statements, I would do so competently.

2. My full name is Peter Alexander, and I reside in Corona del Mar, Orange County, California. I am an independent consultant and operate as a sole proprietor offering computer technology advisory and forensic analysis services to the legal profession. Before becoming a consultant, I was a professional engineer for approximately 28 years. A full summary of my credentials is provided in my c.v. attached as Exhibit 1 to my declaration.

3. On or about August 1, 2003, I was retained by Hennigan Bennett & Dorman, counsel for plaintiff Acacia Media Technologies Corporation ("Acacia"), as an independent technical expert in this case. I am being compensated at an hourly rate of $175. My compensation is not contingent upon the outcome of this litigation.

4. I understand that plaintiff Acacia accuses New Destiny Internet Group, et al. (collectively "Defendants") of infringing U.S. Patent Nos. 5,132,992 ('992) and 6,144,702 ('702) (collectively, the "patents-in-suit"). I have reviewed the '702 patent and its prosecution history, and other relevant documents in forming opinions expressed in this declaration.

5. I was asked by counsel for Acacia to provide expert opinions on the following issues:

a. What is the level of skill in the art of the hypothetical person of ordinary skill in the art to which the '702 patent is directed? In other words, I was asked to describe in my opinion the skills, background, educational level, and experience of a hypothetical person who would be reading the '702 patent to design and implement the transmission and receiving systems described in the '702 patent at

the time of the invention. I was told by Acacia's lawyers to assume that the time of the invention is January 7, 1991.

b. What would the hypothetical person of skill in the art at the time of the invention understand the claim terms "identification encoder" and "sequence encoder" to mean in light of the '702 patent specification. Would either of those terms be indefinite to such a hypothetical person of ordinary skill in light of the teachings in the patent itself?

c. Finally, I was asked to provide an opinion on the following question: Would a hypothetical person of ordinary skill in the art, using the knowledge available to that person in early January 1991 and the disclosure of the '702 patent be able to make and use an identification encoder in the transmission system described and claimed in the '702 patent without undue experimentation?

Throughout this expert report, whenever I describe what one of ordinary skill in the art would have understood, I am referring to the time of the invention, unless I state otherwise.

BRIEF STATEMENT OF BACKGROUND AND QUALIFICATIONS

6. I have a Ph.D. in Electrical Engineering from the Massachusetts Institute of Technology; an M.S. in Electrical Engineering from the University of Illinois (Urbana); and a B.S. in Electrical Engineering from the University of Canterbury (New Zealand).

7. I have 28 years of design and development experience in business and scientific software applications, including responsibilities for the design, specification, and implementation of parallel processing systems, distributed computer systems, and networking systems. During the years 1982 - 1990, I was actively engaged in the design of computer systems that involved distributed multiprocessor architectures; it was during this same period that the notion of object identification encoding emerged as a solution to the problem of keeping track of

distributed objects in a networked system. During the years 1994.- 1997, I was actively engaged in the design of computer systems that involved encoding, compression and editing of video and audio content in digital form. I was responsible for the development of software systems that created libraries of MPEG-1 format multimedia files, and I am therefore familiar with the issues of organizing encoded data into ordered sequences.

STATEMENT OF OPINIONS

8. I was asked to give an opinion as to the educational and vocational qualifications of one of ordinary skill in the subject matter taught by the patent at the time of the invention. In January 1991, a hypothetical person of ordinary skill in the art to whom this patent is addressed would have a range of knowledge roughly equivalent to that of a person holding the degree of Bachelor of Science in Electrical Engineering, Computer Science, or Computer Engineering with experience in systems design in the broadcast industry. An actual engineering degree or a higher degree than a Bachelor's degree would not be necessary since none of the patent subject matter is at a high theoretical level; rather, it reflects engineering systems design and implementation practice. This person would have at least three years of experience in designing systems that distributed digital content and, from an engineering perspective, would be knowledgeable about over-the-air broadcast, cable, and satellite distribution and broadcast systems. As a systems designer and team leader, this hypothetical person would be capable of directing tasks in hardware engineering, computer architecture, and software engineering. In reaching this opinion as to the qualifications of the hypothetical person of ordinary skill in the art, I have considered the types of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level of active workers in the field. I have discussed my opinion regarding the person of ordinary skill in the art in a telephone call with Merrill Weiss on Tuesday, October 19, 2004 at approximately 8:00 p.m. Eastern time. Mr. Weiss

and I were in agreement as to the qualifications of a person of ordinary skill in the art and we discussed, and ultimately agreed upon, the specific qualifications which are described above.

9. Counsel for Acacia have also requested that I render an expert opinion on the meaning of certain terms from the claims of the `702 patent based on the perspective of one of ordinary skill in the art reading the patents claims in light of the teachings of the specification, and whether one of ordinary skill would find the phrases "sequence encoder" and "identification encoder" indefinite and whether one of ordinary skill in the art would find the "identification encoder" not enabled by the specification of the '702 patent.

10. It is my opinion that one of ordinary skill in the art would have understood at the time of the invention what is meant by the claim term "sequence encoder" when the claims of the '702 patent are read in light of the specification of the '702 patent. It is my opinion that one of skill in the art would have understood the claim term "sequence encoder" to mean "computer hardware and software to create numeric or alphanumeric time codes." The bases for the opinions stated in this paragraph are set forth in the section of this declaration entitled The Reasons the Term Sequence Encoder is Understandable.

11. It is my opinion that one of ordinary skill in the art would have understood at the time of the invention what is meant by the claim term "identification encoder" when the claims of the '702 patent are read in light of the specification of the '702 patent. It is my opinion that one of skill in the art would have understood the claim term "identification encoder" to mean "a device or computer program to create unique codes, typically consisting of strings of alphanumeric characters, that is capable of assigning these codes to computer data objects such as data files for the purpose of tracking in a distinct and uniquely identifying way. " The bases for the opinions stated in this paragraph are set forth in the section of this declaration entitled The Reasons the Term Identification Encoder is Understandable.

12. It is my opinion that one of skill in the art, using the knowledge available to that person in January 1991 and using the '702 patent specification, could have made and used an identification encoder in January 1991 without undue experimentation. The bases for the opinions stated in this paragraph are set forth in the section of this declaration entitled Enablement of Identification Encoder.

THE REASONS THE TERM "SEQUENCE ENCODER" IS UNDERSTANDABLE

13. By examining the language of the claims of the '702 patent together with the specification and drawings of the '702 patent, I believe that one of ordinary skill in the art would have been able to understand what is meant by the term "sequence encoder."

14. One of ordinary skill in the art would have understood the systems disclosed in the '702 patent are comprised of hardware and software normally associated in January 1991 with computers, microprocessors, and computer storage. This is evident from, among other things, the discussion throughout the patent specification of digital data, computer files, networks, databases, data blocks, processors, processing, computer tapes, disks, cartridges, and other types of computer storage. The systems disclosed in the '702 patent also use common communication channels, such as, cable, satellite, and broadcast television, and telephone, ISDN, and metropolitan and local area networks.

15. One of ordinary skill in the art would therefore interpret the term "sequence encoder" within the context of computer multimedia capture and editing systems. The `702 patent specification discloses a hardware and software system for capture and manipulation of multimedia content. From a knowledge of video editing and videodisc pre-mastering, one of ordinary skill in multimedia systems reading the patent would immediately know from personal experience that a sequence encoder could be implemented using a frame-level time encoder, a device and technology that was well understood at the time of the invention.

16. One of ordinary skill in the art would have understood that the `702 patent claims and specification teach a computer system that is used to manage the compression, storage and dissemination of multimedia content. Specifically, independent claims 1, 17, and 27 teach a sequence encoder as part of a compressed data multimedia library system along with a de-compressor and multimedia playback system. The various functional elements of the system are inter-connected by data communication elements, denoting a digital hardware or computer-based system. Independent claim 17 also recites the connection of the sequence encoder to the rest of the system: "a sequence encoder in data communication with said digital data output," reinforcing the idea of a computer system with interconnecting data paths.

17. One of ordinary skill in the art would first examine the `702 patent claim language to find references to "sequence encoder." There are six references to "sequence encoder" in the claim language.

18. The first express reference to sequence encoder appears in the claims themselves (at 19:30 (Claim 1)) and merely indicates that a sequence encoder is distinct from an identification encoder. However, at 20:2, we are told that a "sequence encoder transforms digital data blocks into a group of addressable data blocks." This clearly describes to one of ordinary skill in the art the function of the sequence encoder. Additional claim language at 20:51 describes the "sequence encoder in data communication with said digital data output" thereby explaining to one of ordinary skill in the art that the sequence encoder is coupled to and cooperative with the conversion process that creates digitized video and audio content.

19. Three references in the claims make clear and reinforce the understanding of one of ordinary skill in the art that a sequence encoder is a building block within the transmission system, and that it is constructed with the function of transforming digital data blocks into a group of addressable data blocks. Claim 18 at 21:9, "A communication system as recited in claim 17, wherein said digital data compressor is in data communication with said sequence encoder"; claim 32 at 22:19,

"A communication system as recited in claim 27, wherein said transmission system further comprises a sequence encoder"; and dependent claim 33, which states at 22:21 "A communication system as recited in claim 32, wherein said sequence encoder transforms digital data blocks into a group of addressable data blocks." One of ordinary skill in the art would understand that "transforming" was synonymous with "encoding," and that the purpose of encoding is to provide addressable, compressed data blocks.

20. One of ordinary skill in the art would also examine the `702 patent specification to interpret the term "sequence encoder" by searching for the term "encoder." There are thirteen references to "encoder" specifically associated with "identification encoder," and nine references to "time encoder."[1] Since the claims make clear that the "identification encoder" is different and distinct from the "sequence encoder, " the "sequence encoder" cannot be the "identification encoder." By simple logic and the process of elimination, one of ordinary skill in the art would understand that the sequence encoder must be the time encoder. But we need not rely on such logic alone, because the specification repeatedly teaches to one of ordinary skill in the art that the time encoder is performing sequence encoding.

21. One of the first references to "time encoder" appears at 7:50-54:

> "The transmission system 100 of the present invention also preferably includes ordering means for placing the formatted information into a sequence of addressable data blocks. As shown in FIG. 2a, the ordering means in the preferred embodiment includes time encoder 114."

One of ordinary skill in the art would see the unambiguous linkage between encoding in a sequence and a time encoder in the specification language – "the invention preferably includes an ordering means, for placing information in a sequence,"

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[1] 7:54, 7:56, 7:57, 8:6, 8:37, 8:48, 8:49, and 10:11.

followed by a reference to Figure 2a, which in fact uses and discloses a time encoder as the preferred embodiment of an ordering means. The association of time encoder as the apparatus to serve as the ordering means to sequence encode information into addressable form would have been inescapable to one of ordinary skill in the art.

22. The reference to "time encoder" at 7:65-8:3 would unmistakably communicate to one skilled in the art that the time encoder is the claimed "sequence encoder":

> "The converted formatted information of the requested material is then preferably in the form of a series of digital data bytes which represent frames of video data and samples of the audio data. A preferred relationship of the audio and video bytes to each other is shown in FIG. 8. Incoming signals are input and converted in sequence, starting with the first and ending with the last frame of the video data, and starting with the first and ending with the last sample of the audio data. Time encoding by time encoder 114 is achieved by assigning relative time markers to the audio and video data as it passes from the converter 113 through the time encoder 114 to the precompression processor 115. Realignment of audio and video data, system addressing of particular data byes, and user addressing of particular portions of items are all made possible through time encoding"

Notice that the first part of the paragraph refers to a converter producing converted formatted information in the form of digital data blocks. Thus, one of ordinary skill in the art would have understood that incoming signals are converted in a sequence of frames of video and blocks of audio data and relative time markers are assigned to the audio and video data as it passes through this converter. To one of ordinary skill in the

art the meaning of the above paragraph would be very clear: Time markers are assigned to frames of video and blocks of audio in a "sequence encoding" step at the time of digitization. One of ordinary skill in the art would have understood that sequence encoding would be synonymous with time encoding. In three tightly coupled sentences, both terms of interest: "sequence" and "encoder," appear in the context of video and audio data conversion and compression together with "addressable. " This passage further teaches one of ordinary skill in the art some of the motives for using time encoding as the preferred method of sequence encoding as being alignment of audio and video data, system addressing of data bytes, and user addressing of portions of items.

23. Further into the specification, the following description is given at 8:37-43.

> "Time encoding by time encoder 114 makes items and subsets of items retrievable and addressable throughout the transmission system 100. Time encoding enables subsequent compression of the information to be improved because data reduction processes may be performed in the time dimension."

This statement explains to one of ordinary skill in the art two reasons for using time coding as the preferred method of sequence encoding. Time coding allows for addressability of individual video segments, and also facilitates the inter-frame compression process, whereby compression is carried out over a sequence of frames with known temporal relationships, rather than just across a single frame in isolation. The use of temporal relationships results in much higher levels of video compression, but requires a time reference to be successful.

24. The reference at 8:46-48 is particularly germane to convey to one of ordinary skill in the art the idea that sequence encoding, time encoding, and addressability are linked together.

"The sequence of addressable data blocks which was time encoded and output by time encoder 114 is preferably sent to precompression processor 115."

Note that the language explicitly states to one of ordinary skill in the art that a sequence of addressable data blocks was time encoded. This could not possibly be interpreted in any way by one of ordinary skill in the art other than that the step of sequence encoding is in fact identical to time encoding. Here, just one short sentence contains both terms of interest: "sequence" and "encoder" together with "addressable." There is no ambiguity to one of ordinary skill in the art that a time encoder is the sequence encoder, which thereby provides the required addressability.

25. Another specification reference 7:54-64 repeatedly uses the term "encoding" when describing addressing of digitized data:

"After the retrieved information is converted and formatted by the converter 113, the information may be time encoded by the time encoder 114. Time encoder 114 places the blocks of converted formatted information from converter 113 into a group of addressable blocks. The preferred addressing scheme employs time encoding. Time encoding allows realignment of the audio and video information in the compressed data formatting section 117 after separate audio and video compression processing by precompression processor 115 and compressor 116."

One of ordinary skill in the art would have made an explicit association between the time encoder and the "converter." The latter would be interpreted as a digitizing device by one of ordinary skill. The time encoder is directly identified to one of ordinary skill in the art as a device that provides addressability of converted video and audio blocks of data. To one of ordinary skill in the art the above specification statement is very compelling evidence that first, the time encoder is none other than

the sequence encoder, acting as it does by assigning relative time markers on frames of sampled video and audio, and second, that the motivation for using sequence or time encoding is to allow "user addressing of particular portions" of the data.

26. The language of dependent claims 7 and 33 "sequence encoder transforms digital data blocks into a group of addressable data blocks" closely parallels the specification language at 7:54:

> "Time encoder 114 places the blocks of converted formatted information from converter 113 into a group of addressable blocks."

Which could easily be re-written as:

> "Time encoder 114 transforms digital data blocks [of converted formatted information from converter 113] into a group of addressable data blocks."

Furthermore, in the Summary of Invention itself, the ordering of formatted data blocks into an addressable sequence is identified as:

> "ordering means, coupled to the conversion means, for placing the formatted data into a sequence of addressable data blocks; compression means, coupled to the ordering means, for compressing the formatted and sequenced data; compressed data storing means, coupled to the compression means, for storing as a file the compressed sequenced data received from the compression means,

This Summary statement strongly links to one of ordinary skill in the art the claim language use of "sequence encoder" and the specification language term "time encoding" through the common terms "addressable" and "addressing."

27. A person of ordinary skill in the art would understand Figure 2a of the specification of the '702 patent as disclosing the role of the time encoding components 114, without any ambiguity. Based on the claim and specification cites

when applied to Figure 2a as a preferred embodiment of the invention, the only possible interpretation by one of ordinary skill in the art of sequence encoder would be that of the time encoding components shown, and the algorithmic structure of a time encoder would be known to one of ordinary skill.

28. Other than time encoding using a time encoder, there is no other encoder or encoding scheme disclosed or suggested in the '702 patent specification for creating a group or a sequence of addressable data blocks. One of ordinary skill in the art would have understood that a time encoder which performs time encoding is the only encoder disclosed in the specification of the '702 patent for creating a group or a sequence of addressable data blocks.

29. Therefore, based only on a reading of the claims and the specification of the '702 patent, it is my opinion that, at the time of the invention, one of ordinary skill in the art, in light of the claims and the specification, would have understood the term "sequence encoder" to mean "computer hardware and software to create numeric or alphanumeric time codes."

30. My opinion that one of skill in the art would understand what is meant by "sequence encoder" is confirmed by how persons of skill in art understood video and audio encoding using computer technology that was taking place during the decade of the 1980's leading up to the '702 patent priority date of January 1991. As will now be demonstrated, sequence encoding using time codes was in fact a common practice used in video and audio editing during the years prior to the invention that was well known to one of ordinary skill in multimedia computer systems.

31. One of ordinary skill in the art active in January 1991would have had the benefit of a decade of prior activity associated with the encoding and editing of video frame sequences using computer-controlled video capture. (See for example Souter88 attached as Exhibit 2, Miller87 attached as Exhibit 3 and White88 attached as Exhibit 4.) The predominant technology in the early part of the 80s was professional quality Video Tape Recorders ("VTR") while the second half of the same decade, beginning

with the release in 1982 of the Philips "Video Disc" brought a multitude of computer-controlled recorders and players: Videodisc and LaserDisc; Compact Disk-Digital Audio ("CD-DA"); Compact Disk-Read Only Memory ('CD-ROM"); Compact Disk Interactive ("CD-I"); and Digital Video Interactive ("DVI") systems involving some combination of the hardware referenced above in conjunction with user-oriented interactive computer programs. The latter, DVI, created as a proprietary system by General Electric was revolutionary in that it permitted up to one hour of full motion video stored on a CD-ROM using compression algorithms and special semiconductor chips.

32. The notion of "sequences" to describe a series of video frames is ingrained to the video production community. The cited article Lippman89 (attached as Exhibit 5) carries the title and introduction: 8 "Coding Image Sequences for Interactive Retrieval. An image coding technique for digital storage of motion picture information is presented that is optimated [sic] for use in interactive systems where high quality still frames, random access, and database linkages are required."

33. Here, a frame of video represents a snapshot in time of the video image, either in analog form as for television signals, or as an array of digital samples of the image. This cited article was published in 1989, and is indicative of the trend at that time towards the encoding of individual video frames for the purpose of random access rather than the simple sequential ordered playback of frames. The patent term "sequence encoding" in the context of video production and transmission describes the assignment of a time code to each frame in a video sequence of frames to achieve addressability. Thus, frame encoding was known to persons skilled in the art before January 1991 to involve the assignment or encoding of a sequence position identifier. In the cited article this tagging was achieved by means of a database of frame information. A device or computer program encodes frame sequence identifiers using numeric or alphanumeric codes drawn from an ordered sequence. Other articles in the early 1980s use similar terminology [See MacKay89 attached as Exhibit 6,

McDonald81 attached as Exhibit 7, Souter88 at pp.47-48 Ex. 2, Miller87 at pp. 8, 20, 38-39 Ex. 3.]

34. In 1967, The US Society of Motion Picture and Television Engineers introduced the "SMPTE" time code (see SmpteXX attached as Exhibit 8). In 1972 the European Broadcasting Union ("EBU") introduced a similar system for 625 line PAL television standards. The SMPTE timecode is represented as an 80-bit binary code and is encoded into studio quality video or audio recordings at 30 frames per second. (EBU timecodes are encoded at 25 frames per second.) These video encoding methods have been used since the early days of studio VTR recording for precision editing and copying of video recordings. (See White88 at pp. 236-238 Ex. 4.) Each frame of video is associated with a unique time code identifier that has time resolution down to seconds and a frame count within a second. This frame level resolution allows copying and editing of individual video frames within a video sequence. From White88 at pp. 239 attached as Ex. 4):

> "Time code editing
>
> To further automate the editing process, the EBU in 1972 standardised an 80 bit digital code which allowed each frame to be identified on a separate audio track (Figure 191).
>
> The code also identifies hours, minutes and seconds, and....When recording, the time of any sequence can be noted and in the editing suite control systems can be set to search and find the particular insert automatically."
>
> When the time code is recorded on the master machine, systems can be produced to store addresses, control

rehearsals and edits and operate the programme of.

instructions."

There is no doubt from this description that during the 1970s and 1980s, SMPTE and EBU timecodes were in use in professional video post-production studios as methods of encoding sequences of frame identifiers onto video clips to allow the registration of precise edit points. The "programme" referred to represents a list of edit point addresses (start frame, stop frame) stored in a computer store. (See White88 pp.240 Ex. 4.) Note the resemblance to portions of the claim 7 and claim 33 language: "A communication system as recited in claim 1, wherein said sequence encoder transforms digital data blocks into a group of addressable data blocks. "

35. Philips introduced the videodisc in 1982. Many different recording formats were subsequently developed, but one in particular, Constant Angular Velocity ("CAV"), was set up to rotate at 30 RPM, so that one rotation corresponds exactly to a single video frame. This configuration allows for the implementation of video interactive applications such as frame level random access, still picture access, and slow motion access, since the head may be held fixed over a single frame track. In describing these systems, frequent references are made to both "sequences" and "encoding" on a per frame basis. For example, at Miller87 page 8 (Ex. 3),

> "Therefore the designer is free to place all kinds of images and sequences on the level I disc"

and at page 10, branching to different video sequences is described;

> "On the entry of the user's input, the player will branch to one of three completely different locations on the disc and play a new sequence based on the user's input."

36. When discussing the production of videodiscs from pre-master tapes, Souter88 uses the following language (See Souter88 page 96 Ex. 2):

> "As with the frame numbers on a videodisc, each frame of videotape is identified by `time code.' This code is

generated by the camera or can be added to the tape later. The frame locations are marked by a number sequence showing hours, minutes, seconds and frames."

Again, one of ordinary skill in the art would have seen that the language used to describe these videodisc production steps is very similar to the `702 claim language that refers to sequence encoder.

37. Miller87, page 96 (Ex. 3), describes sequence encoding used in video post-production steps. The encoded sequence on the pre-master tape consists of pulse codes, from which the mastering equipment derives sequential frame numbers to be inserted on the disc:

> "The first set of pulses is the picture cue that identifies the start of a complete frame and triggers the frame counter in the mastering equipment. Frame numbers are entered sequentially on discs made from non-cued tapes
>
> Sequential frame numbering in the composite video (non-cued) mode works well only if the disc is used for linear play or has consistent field dominance."

38. As described in Miller87 at pp. 9-17 (Ex. 3), videodisc systems employ computers and computer interfaces for interactive control of video playback, such as user selected branching between video sequences on the basis of encoded frame markers. For one of ordinary skill, the terms "sequence" and "encoding" used in the context of computer controlled video systems would be familiar in 1991, and the concept of "sequence encoding" using timecodes and other frame reference markers in these systems would also be known. Companies such as Digital Equipment Corp. (IVIS), Matrox (LVC-2001AT), Interactive Training Systems (ITS 3100), Pioneer (LDNS-1), NCR (InteracTV), IBM (InfoWindow) and Sony (SMC-70, SMC-2000 and SMC-3000V) offered commercial computer products in the 80s for use typically

in video kiosk systems, where users could navigate with light pens and touch pads through the available content.

39. The use of timecodes to encode sequences of video frames for use in the creation of a videodisc master was common before January 1991. For the most part the objective is one of addressing individual video frames. The universal method is to cross-reference the significant frame to the SMPTE time code providing "the most accurate method of transferring frame address information from the pre-master tape to the discs" (Miller87 page 93 Ex. 3).

THE REASONS THE TERM "IDENTIFICATION ENCODER" IS UNDERSTANDABLE

40. By examining the language of the claims of the '702 patent together with the specification and drawings of the '702 patent, I believe that one of ordinary skill in the art at the time of the invention would have been able to understand what is meant by the term "identification encoder."

41. As discussed above, one of ordinary skill in the art would have understood the systems disclosed in the '702 patent to be comprised of hardware and software normally associated in January 1991 with computers, microprocessors, and computer storage over common communication channels. Therefore, one of ordinary skill in the art would have interpreted the term "identification encoder" within the context of computer multimedia capture and editing systems capable of creating and transmitting digital data over such communication channels. In this regard, the `702 patent specification discloses a hardware and software system for the manipulation of multimedia content, with the apparatus corresponding to an identification encoder inherently disclosed. From a knowledge of file system and database technology, one of ordinary skill in multimedia systems reading the patent claims and specification would immediately know from personal experience that an identification encoder could be implemented using one of several techniques that were well understood in January 1991.

42. Specifically, claim 1 of the '702 patent teaches to one of ordinary skill in the art an identification encoder in data communication with a library of compressed data objects. Furthermore, the identification encoder assigns to each of the items in the compressed data library a unique identification code. To one of ordinary skill in the art, the language of claim 1 would have been clear and unambiguous, having the connotation of a computer encoder that associates a unique digital code with a stored multimedia library object. In practice, one of ordinary skill in the art would have known that these compressed library objects would be files or similar data objects.

43. One of skill in the art would first examine the '702 patent claim language to find references to "identification encoder." There are 13 references to "identification encoder" in the claim language."[2]

44. The reference at 19:31-34 (Claim 1) provides information on the purpose of an identification encoder: "wherein said identification encoder gives items in said compressed data library a unique identification code." With this claim element, it would have been clear to one of ordinary skill in the art that an identification encoder performs a function most people would understand - identifying or cataloging items in a library of objects.

45. At 19:65 (claim 5), "data formatting device in data communication with said identification encoder" indicates the position an identification encoder has relative to the formatting device, and at 19:67 "identification encoder allows entry of a popularity code" communicates that it is a computer related function, likely to be implemented in software.

46. At 20:46 (claim 17), "identification encoder in data communication with said source material library" one of ordinary skill in the art would have seen that the identification encoder potentially acts on the source or input material. The presence of

[2] 19:31, 19:33, 19:34, 19:65, 19:67, 20:46, 20:5121:12, 22:16, 22:19, 21:43, 21:44, 21:46.

the surrounding language, "converter having a data input in data communication with said source material library and a digital data output" and "digital data compressor in data communication with said digital data output" would be read by one of ordinary skill as a system involving source data that is digitized and output to a digital compression device. One would also conclude that the role of the identification encoder would be an adjunct component in the digitization and compression process.

47. Claim 19 at 21:12 "wherein said compressed data formatting device is in data communication with said identification encoder" and claim 31 at 22:16-19 "a compressed data formatting device in data communication with said identification encoder" communicates essentially the same thing to one of ordinary skill in the art; that identification encoding is closely tied to the data compression. At the time of the invention, data compression would have been visualized by one of ordinary skill in the art as a computer related operation, involving both hardware and software, with the compressed data stored on in a file on a computer disk.

48. One of ordinary skill in the art would also examine the '702 patent specification to interpret the term "identification encoder." The person skilled in the art would find that there are thirteen references to "identification encoder" and discussion of the term "storage encoding."[3] Many of the references point to item 112 in Figure 2a as the identification encoder, even though it does not have that precise caption in the Figure itself.

49. Figure 2a depicts the identification encoder 112 as an "identification encoding process." One of ordinary skill would naturally associate the term "process" with a computer program, since the entire system described by Figure 2a strongly

[3] The storage encoding function is also described as part of identification encoder 112 in Figure 2a, providing the function of issuing unique identification codes among other things. At 6:34 - "***Storage encoding, performed by identification encoder*** 112, aside form [sic] giving the item a unique identification code, optionally involves logging details about the item, called program notes, and assigning the item a popularity code. "

suggests a computer system, and it is not customary to refer to pure hardware implementations as "processes." Of course this does not rule out a combination of hardware and software elements.

50. At 6:30-38, there is a lengthy discussion of the functionality provided by an "identification encoder." First, "the item must be stored in at least one compressed data library 118, and given a unique identification code by identification encoder 112." Note first that the purpose of the system depicted in Figure 2a would have been understood by one of ordinary skill in the art to create multimedia files consisting of digitized data in compressed form, as described at 6:32-34: "the item must be stored in at least one compressed data library 118, and given a unique identification code by identification encoder 112. " The reference to storing compressed data would connote the idea of a digital data file to one of ordinary skill. This discussion of "identification encoder" functionality is also framed by the prior commentary at 6:19-22, which emphasizes the goals of identification encoding. Because there is possibility of a plurality of source libraries: "The source material library 111, according to a preferred embodiment of the present invention, may preferably include a single source material library or a plurality of source material libraries" one of ordinary skill would naturally be thinking of the issues and difficulty of dealing with multimedia content across a network. As will be described, the idea of unique identifiers for networked computers was well understood at the time of the invention, and one of ordinary skill would have immediately read the above phrases to describe the well-known algorithms for implementing unique identification codes in a network configuration.

51. The preferred embodiment for an "identification encoder" is discussed at 6:53-78 with the following language: "after identification encoding is performed by identification encoder 112, the retrieved information is placed into a predetermined format as formatted data by the converter 113. The items stored in source material library 11 and encoded by identification encoder 112 may be in either analog or digital form." There could be no doubt to one of ordinary skill that the task of

identification encoding was simply one of assigning a distinct code with each new multimedia file, at the time of converting multimedia content, for the purpose of easy and unambiguous retrieval at a later date.

52. At 7:13-18, the description is in terms that would easily be understood by one of ordinary skill: "The analog audio converter 123a preferably converts the retrieved audio signal into pcm data samples at a fixed sampling rate. The analog video converter 123b preferably converts the analog video information, retrieved from identification encoder 123, into pcm data also at fixed sampling rates" It is self evident that the system is capable of digitizing analog data, a familiar task to one of ordinary skill. This digitization step takes place once the identification encoder has been primed with the knowledge of which particular analog (or digital) data is to be converted. Here one of ordinary skill in the art would have understood that the identification encoder is cognizant of the target content (item) for conversion and storage, so that it may act in concert with the item digitization and storage steps to create a persistent unique identification code. This is true even in those cases where the data has already been digitized and compressed, as seen at 7:35-41: "In some cases, such as in inter-library transfers, incoming materials may be in a previously compressed form so that there is no need to perform compression by precompression processor 115 and compressors 128 and 129. In such a case, retrieved items are passed directly from identification encoder 112 to the compressed data formatter 117."

53. At 10:4-11, one of ordinary skill in the art would have seen a confirmation of the idea that this system involves the creation and storage of compressed digital multimedia content in the form of computer files, at least in its preferred embodiment:

> "After compression processing by compressor 116, the compressed audio and video data is preferably formatted and placed into a single file by the compressed data storage

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> means 117. The file may contain the compressed audio and/or video data, time markers, and the program notes. The file is addressable through the unique identification code assigned to the data by the identification encoder 112."

One of ordinary skill in the art would have understood that the files created in this process are addressable or locatable by virtue of their unique identification codes, as generated by the identification encoder itself. As will be described subsequently, one of ordinary skill at the time of the invention would have had a clear understanding of the concept and the detailed implementation required to carry out these steps. Many forms of identification encoding algorithms were well known in 1991.

54. This conclusion by one of ordinary skill in the art would have been reinforced by 6:37-44:

> "The unique address code is an address assigned to the item by the system operator during storage encoding, which is preferably done prior to long term storage in the compressed data library 118. In a preferred embodiment, the unique address code is used for requesting and accessing information and items throughout the transmission and receiving system. The unique address code makes access to the requested data possible."

55. The use of database techniques to implement the identification encoding procedures was also well understood by one of ordinary skill at the time of the invention. At 10:45-59, the database approach is described in some detail. First, the broad character of a database solution is indicated:

> "The storage encoding process performed by encoder 112 also allows entry of item notes and production credits. Production credits may include the title, names of the creators of the item such as the producer, director, actors,

> etc. Other details regarding the item which may be of interest and which may make the items more accessible are kept in an item database."

Then at 10:52-56:

> "Item addresses are mapped to item names by identification encoder 112 and may preferably be used as an alternative method of accessing items. The item names are easier to remember, thus making user access more intuitive by using item names. The storage encoding entry process performed in identification encoder 112 operates a program which updates a master item database containing facts regarding items in the compressed data library system."

One of ordinary skill in the art would have understood that the database methodology described above uses a database record to associate the file storage address with a logical item name. Such techniques were well understood by person of ordinary skill in the art at the time of the invention. Then, at 10:56-59, the specification outlines a computer program operated by or as part of the identification encoder program to carry out this database encoding step:

> "The storage encoding entry process performed in identification encoder 112 operates a program which updates a master item database containing facts regarding items in the compressed data library system. The storage encoding process may be run by the system operator whereby the system operator accesses the master item database to track and describe items stored in one or more compressed data libraries. The names and other facts in the item database may preferably be updated at any time via the storage encoding process. Changes made to the master item

database may be periodically sent to the remote order processing and item database 300."

From this description, one of ordinary skill would have sufficient information to implement at least one version of an identification encoder capable of creating unique identification codes.

56. At 12:4-5, one of ordinary skill in the art would have seen once again that the identification encoder may preferably be capable of carrying out other tasks in addition to assigning unique identification codes to data items, such as entry of popularity codes. Finally, at 18:22-25, we are told that the data items under discussion are actually files containing compressed data, and that the files have an associated identification code:

> "Processing step 413 also includes compressing the formatted and sequenced data performed by data compressor 116 (step 413d), and storing as a file the compressed sequenced data received from the data compression means with the unique identification assigned by the identification encoding means (step 413e)."

This language provides a clear confirmation to one of ordinary skill in the art that files are one form of embodiment for stored compressed data. In subsequent paragraphs, I will show that one of ordinary skill in the art as of 1991 would have a detailed working knowledge of methods to implement unique identification encoding of such items.

57. Therefore, based only on a reading of the claims and the specification of the '702 patent, it is my opinion that, at the time of the invention, one of ordinary skill in the art in the field of computer architecture would have understood the term ***"identification encoder"*** to mean "a device or computer program to create unique codes, typically consisting of strings of alphanumeric characters, that is capable of

assigning these codes to computer data objects such as data files for the purpose of tracking in a distinct and uniquely identifying way."

58. My opinion that one of skill in the art would have understood what is meant by "identification encoder" is confirmed by how persons of skill in the art understood computer technology and architecture innovation that was taking place during the decade of the 1980's leading up to the '702 patent priority date in January 1991.

59. To understand the meaning of "identification encoder," a person skilled in the art must also understand the meaning of "unique identification code, " because the patent claims state that the "identification encoder" gives items in the compressed data library a "unique identification code. " The computer terms "universal unique identifier" and "universal identifier" had wide currency in computer systems architecture for the decade prior to the invention. These terms are semantically identical to the term "unique identification code" used in the `702 patent claim language, and are derived from precisely the same technological origin.

60. While there is ample evidence that the concept of ***"unique identification code"*** was well understood during the decade prior to January 1991, it is also true that the use of identification encoding was encapsulated into more formal and rigorous specifications and standards during the years immediately following the invention (1991-1995). In today's computer systems the concept of ***"unique identification code"*** is even more pervasively employed in the tracking of data files in a unique way, particularly multimedia files, thereby reinforcing the assertion that the origin of identification encoding in the 1980s was well understood within the context of cataloging and tracking of computer data files.

61. Before reviewing the specific use of these terms as employed in computer systems, it is useful to generalize the discussion to include some more familiar examples. When constructing "unique identifiers," the goal of course is to create a name or identifier that can precisely select or locate one thing or object with

certainty. Thus, US residents may apply for a Social Security number, which, for better or worse, helps identify us to the IRS, banks, insurance companies etc as a unique individual. In the US, there is no ambiguity regarding the uniqueness of the Social Security numbers because they are issued from a central authority that can mandate uniqueness. As seen from this specific example, the concept of a "unique identifier" is relative in scope. The Social Security number is unique for US residents, but of no value in identifying individuals on a worldwide basis, as any information system designer is painfully aware.

62. Another "unique identifier" is the Ethernet address used by computers [Yogen8l attached as Exhibit 9]. The Ethernet was invented over a period of a few years and eventually described in detail in 1976 in a paper titled, "Ethernet: Distributed Packet-Switching For Local Computer Networks" [Metcalfe76 attached as Exhibit 10]. Ethernet interfaces that a computer might have with a Local Area Network ("LAN") are assigned a unique identifier obtained from a central authority. Complete 48-bit Universal LAN addresses uniquely identify Ethernet addresses for all computers on the planet. .

63. In the last two decades, software and hardware manufacturers have capitalized on this 48-bit physical uniqueness key to derive other "Globally Unique Identifiers" ("GUIDs") or "Universal Unique Identifiers" ("UUIDs"). The former, GUID is simply the Microsoft variant of an industry standard that defined UUIDs. In the most common schemes, a 128-bit GUID is created using as a starting point the 48 bits from the local computer Ethernet adapter, thereby ensuring worldwide uniqueness. Many objects on a personal computer are associated with GUIDs: Serial numbers, media players, multimedia files on a hard drive, functions exposed in software modules, re-usable software components and executing programs. Even documents created by Microsoft Office such as Word text documents and Excel

spreadsheets[4] are all likely to have an associated GUID, unique to each individual object. The various algorithms for creating GUIDs are equivalent to ***"identification encoders"*** and were conceived more than two decades ago.

64. The last discussion point highlights the second important aspect of "unique identifiers" - that they are identifiers applied to a specific class of objects. For information technology fields, GUIDs are used widely to apply to computer serial numbers, LAN cards, executing programs (processes), interface functions, documents, data objects and/or data files. Within the context of this patent, the class of objects referred to is limited to data objects in a compressed library.

65. These ideas have been well understood by the computer science and computer engineering community for 20 years. A "unique identification code" today is generally understood to be a GUID or a UUID, but even in 1985 the world of computer design had already strongly embraced the concept of "unique identifier," generally with the less lofty goal of being able to track computer-related objects only within the scope of a single distributed computer system, similar to the system described by the `702 patent. I will provide many such examples of the use of "unique identifiers" and the encoders used to construct "unique identifiers" from technical publications of the 1980s.

66. During the period 1982 - 1990, a set of computer technologies emerged to address the need for distributed computer systems. In this experimental phase, the term "unique identifier" was used precisely and frequently by the pioneering engineering groups working on commercial and research-oriented distributed computer systems. One of ordinary skill in the art would certainly have been aware of the meaning of the term in an unambiguous sense.

[4] As anticipated, the tracking of individual documents on a personal computer has provoked outrage and dismay on the part of privacy rights advocates.

67. The Unix operating system, first created in 1969, employs unique identifiers in somewhat related ways, by encoding a unique identifier associated with a user into the metadata describing file objects. This is illustrated by Franta80 p 111 attached as Exhibit 11, a publication from an ACM symposium in 1980, where the author refers to the characteristics of UNIX file systems:

> "For example, UNIX implements the concept of ownership in that files and directories are associated with specific users by a unique identification code."

The terminology unique identification code is identical to that used in the `702 patent, even though here it refers to a user identifier whereas in the patent it refers to a file identifier. Even earlier than this in 1974, Ritchie one of the creators of Unix, discloses at page 367 the internal file structure of Unix and the concept of "unique user identification number" to describe the way in which files are assigned identifiers corresponding to the individual users who created them [Ritchie74 attached as Exhibit 12] :

> "Although the access control scheme in UNIX is quite simple, it has some unusual features. Each user of the system is assigned a unique user identification number. When a file is created, it is marked with the user ID of its owner."

In this reference, the unique identifier again refers to a numeric value representing a user identifier. These citations are useful only to show that the terminology of identification codes was in use as early as 1974. However, as a result of the evolution of distributed computing systems, "unique identification code" terminology soon embraced a narrower meaning that is directly relevant to claim 1 of the `702 patent

68. "Data object" is a term that will be used here to refer to segments or collections of data elements that are organized and manipulated as a group, including computer data files. During the period 1980-1990, computer architecture evolved

rapidly from mainframe and laboratory-based minicomputer systems to LAN-based workstations sharing resources as an integrated distributed computing system. The impetus for this move came primarily from the success of the DecNet file-sharing system developed by Digital Equipment Corporation. Other notable distributed computing architectures that emerged during the 80s were: Chorus (developed by the French research institute INRIA [Chorus] attached as Exhibit 13); Mach (developed at Carnegie Mellon University [Mach] attached as Exhibit 14); and the Apollo Domain product from Apollo Computer Corp. [Leach82 attached as Exhibit 15, Leach85 attached as Exhibit 16].

69. With distributed computer systems, there was an urgent need to identify, in a unified and unique way, distributed objects scattered about the network, so that any workstation on the network could locate the objects. The earliest discussion that I am aware of pertaining to unique identifiers of this type is in a 1979 paper describing unique identifiers used in the WFS file system [Swinehart79 attached as Exhibit 17]. A more complete expose of identification encoding is given in a 1982 paper describing the use of "unique identifiers ("UIDs") as deployed in the Apollo Domain system [Leach82 Ex. 15].

70. The Apollo Domain system, which was marketed as a successful commercial product during the mid 1980s, utilized distributed object architectures with the fundamental premise that the file system components could be accessed as data objects using their "Unique Identifiers" ("UIDs"). From Leach85 page 310 (Ex. 16):

> "The OSS provides a flat space of objects (storage containers) addressed by unique identifiers (UIDs). Objects are typed, protected, abstract information containers: associated with each object is the UID of a type descriptor, the UID of an access control list (ACL) object, a disk storage descriptor, and some other attributes: length; date

time created, used and modified; reference count; and so forth. Object types include: alphanumeric text, record structured data, IPC mailboxes. . . .”

71. As explained in the above passage, the Apollo Domain Object Storage System (“OSS”) is populated with “Unique Identifiers” or UIDs. Data objects in the storage system have an associated UID. Each data object is given a unique identifier within the scope of the network. One of ordinary skill in the art in January 1991, reading the term “unique identification code” in the ‘702 patent, would have in mind these UIDs, particularly when reading the following portions of the ‘702 patent specification:

> “Storage encoding, performed by identification encoder 112, aside form [sic] giving the item a unique identification code, optionally involves logging details about the item...”

`702 patent, 6:35-38.

> “In a preferred embodiment of the present invention, the method of encoding the information involves assigning a unique identification code and a file address to the item, assigning a popularity code, and inputting the program notes. This process is identical for any of the different media types stored in the source material library 111.”

‘702 patent, 6:42-47.

72. The structure of the UID or ***“unique identification code”*** as described in Leach85 at page 311 Ex. 16, section 4.1, is as follows:

> “UIDs of objects are bit strings (64 bits long); they are made unique by concatenating the unique ID of the node generating the UID and a time stamp from the node’s timer.”

A naming server at each node responds to requests made by processes for file objects with particular UIDs. This software component is responsible for communicating with other name servers on the network for in formation about remote objects. (See Leach82, page 37 Ex. 15.)

73. As indicated above, one of ordinary skill would understand the compressed material library 118 (Figure 2b) to be a file-oriented data storage system, indicating an implementation very similar to the Apollo Domain file OSS. The structure to implement an identification encoder to satisfy the `702 patent claim language would have been known to one of ordinary skill in the art because he or she would have understood the scope of uniqueness and well known implementation methods available at the time. For example, the structure of the Apollo UIDs was defined in Leach82 at page 37 (Ex. 15):

> ". . . concatenate the node ID of the generating node with a reading from its real time clock. The first issue to deal with was choosing the size of the UID. We had a 48 bit 4 microsecond basic system clock, but that, plus a 20 bit node ID, and a few bits for future expansion, seemed to imply a UID that we felt would be a bit long. We settled on a 36 bit creation time, which meant a 16 millisecond resolution. We justified it by noting that, since most objects reside on disk they can't be created faster than disk speeds, 36 bits allowed a resolution several times higher. To allow for possibly bursty UID generation, the system remembers unused UIDs from the previous minute or so, and uses them before generating new ones."

This is one form of structure for an ***"identification encoder"*** capable of creating a unique identification code within the scope of a complete network, where all of the nodes have been assigned different (unique) node numbers. It is not the only possible

structure. For example, as described earlier, it was also common to use a computer's Ethernet card address as a starting point, and to concatenate that address with a time stamp or even a random number, thereby gaining uniqueness over all the universe of all computers in the world.

74. Other uses of identifiers in file storage systems prior to the January 1991 date of invention are well documented and include (from Leach82 at pages 34-35 Ex. 15):

- "The Woodstock File Server (WFS) [Swinehart79 Ex. 17], which uses "file identifiers" (FIDs) to name files. FIDs are 32 bit unsigned integers, which are unique for all time within an individual WFS server."
- "Pilot [Rede1180 attached as Exhibit 18] uses "universal identifiers (UIDs)" to name files; they are 64 bits long and "guaranteed unique in both space and time". UIDs were chosen so that removable volumes could be transported between machines without fear of conflict. A B-tree is used to map UIDs to physical disk addresses."
- "The distributed file system (DFS) [Sturgis80 attached as Exhibit 19] also uses UIDs. We suspect that they are really UIDs because the implementors provide "a simple locating service" to help find the server which holds a file, given only its UID; a structured name would not need a locating service. Like Pilot, a B-tree is used to map UIDs to physical disk addresses. files reside. "
- "The Cambridge File Server (CFS) [Dion80 attached as Exhibit 20] uses what it calls UIDs to name files. They are 64 bits long; 32 bits are a random number, and 32 bits contain the disk address of the object's descriptor."
- "The Felix File Server [Fridrlch81 attached as Exhibit 21] uses a system generated "File Identifier" (FID) to name files. AN FID is a "universal access capability" for the file it names."

75. The prior examples represent UIDs that have uniqueness across an entire distributed network. Other forms of UIDs have even narrower uniqueness scope. The Network File System ("NFS") developed by Sun Microsystems in the early 1980s also uses identification encoding to track file objects in a distributed system. NFS allows client computers to access a remote server's file systems as if they were located physically at the client location. In this example, the unique identifiers are unique "file handles" within the scope of a single NFS server. They are created and managed by the NFS server itself. An NFS client must maintain knowledge of the particular server a set of file handles belongs to, since the uniqueness is only server wide in scope.

76. NFS has undergone three major revisions, but it is useful to examine in greater detail NFS Version 2, the first publicly released version. (Version 1 was never officially released.) Version 2 was first distributed with Sun's SunOS 2 operating system in 1985 and was widely licensed to numerous UNIX workstation vendors. A freely distributable, compatible version was developed in the late 1980s at the University of California at Berkeley.

77. Each object on the NFS-mounted file system is referenced by a unique object called a file handle. [UNIX85 attached as Exhibit 22] These file handles uniquely identify every file and directory on the server computer. Under UNIX, a file handle consists of at least three important elements: the file system identifier, the file identifier, and a generation count. The file identifier can be something as simple as the internal Unix file identifier (referred to as an inode pointer) used by Unix to refer to a particular item on a disk partition. The file system identifier refers to the partition containing the file since the Unix inode numbers are unique per partition, but not per storage system. These structures and algorithms for creating a unique file identifier in the form of a file handle, are well know and have been widely implemented for NFS since the mid 1980s.

78. The terminology in use during the 1980s describes NFS file handles in terms such as [NFSV2 at page 1 attached as Exhibit 23]:

> "A file handle is an opaque string of bits which is used to uniquely identify a file or other filesystem object. In Version 2, the file handle in 256 bits long (32 bytes). This leaves the server free to encode information about the file into the file handle in what-ever way it sees fit."

As discussed in NFSV2, a comprehensive, algorithmic description of the structure of a file handle is given. The two cited references Srinivasan89 attached as Exhibit 24 and Eliezer90 attached as Exhibit 25 provide additional insight. In Eliezer90 at page 326, the authors state:

> "Location transparency provides users with a convenient way to share data. Users may share remote files by naming them in a location-transparent manner . . . files are named by some combination of their host name and local name, which guarantees a unique system-wide name. In Ibis for instance, a file is uniquely identified by the name host:local-name . . . "

These references provide detailed information regarding the structure of unique identification file handles used in the NFS distributed file system.

79. Clearly during the years prior to 1991 there was considerable research effort going into NFS and another well know distributed file system known as Andrews File System. The latter was developed at Carnegie Mellon University during the 80s. Developers of the Andrews File System were well aware of the importance of implementing unique identifiers for tracking of file objects in a distributed system. For example, Morris86 page 193 attached as Exhibit 26 states:

> "The VICE-Venus interface in VICE-II uses unique file identifiers (fids) rather than full path names. A fid contains a volume number"

while Howard88 at page 59 attached as Exhibit 27 uses the phrase:

> "To alleviate these problems we reintroduced the notion of two-level names. Each Vice file or directory is now identified by a unique fixed-length *Fid*. Each entry in a directory maps a component of a pathname to a fid."

80. It should be noted that one of ordinary skill in the art must consider even narrower scopes for naming file objects uniquely. One example is uniqueness across a partition on a computer hard drive. The partition ID, full path name, and file name together constitute a unique identifier within the hard drive itself. This is in fact a common method of assigning a unique identifier for modern day video encoding systems. The operator types in a directory and file name for a particular drive letter where the encoded/compressed file will be stored. The operating system will ensure that the identical path-name pair cannot be used again to identify another multimedia file, thereby ensuring uniqueness. Thus, the partition, path name, file name triplet represents another form of unique identification encoding.

81. Open Software Foundation ("OSF") is an industry consortium formed in 1987 to unify the Unix product offerings from many diverse companies such as HP, Sun, DEC, IBM, DEC, Apollo, Groupe Bull, Nixdorf and Siemens. The initiative was titled: Distributed Computing Environment ("DCE"). In 1989 OSF issued a Request For Technology to the computing industry, inviting them to bid technologies in each of the identified areas. The technologies evaluated by the OSF included "unique identification codes" for tracking of distributed data objects. Although the first OSF release, DCE v1.0 did not appear until 1991, the evidence points to intense technology evaluation and selection during the years 1989 and 1990, indicating an industry-wide awareness of the terms in question prior to the patent date.

82. In various patents on distributed computer architecture applied for in the time period of the invention there are references to unique identification codes. For example Khoyi , et al. United States Patent 5,206,951 attached as Exhibit 28 filed in

April 3, 1991 (as a continuation of copending application Ser. No. 07/088,622 filed on Aug. 21, 1987) refers to:

> 2.1(a) Object ID--4 bytes--the record serial number; uniquely identifies the object within the catalog. A new Object ID may be assigned if the object is moved so as to be indexed in another catalog

This patent relates to the identification of distributed network objects in a catalog through the use of unique Ids.

83. In 1989 another industry consortium consisting of several hundred companies referred to as the Object Management Group ("OMG") was formed to address object standards, and in particular distributed object standards. On December 6, 1990, the newly formed OMG Technical Committee issued a request for proposals on the concept of "Object Request Brokers" ("ORBs") [OMG90 attached as Exhibit 29]. This was part of a new technology framework referred to as Common Object Request Broker Architecture" ("CORBA"). After almost two years of development, CORBA 1.0 was released in October 1991, and it included the CORBA Object model, Interface Definition Language (IDL), and the core set of application programming interfaces (APIs) for dynamic request management and invocation (DII). An integral part of these defining specifications was the use of a unique identifier to track distributed objects. Although the formal specifications emerged after January 7, 1991, it is still clear that the industry was aware of the need to provide encoding schemes for distributed objects prior to January 7, 1991.

84. During the initial years of the OSF standardization activities, Microsoft Corporation participated as a member company, but later disassociated itself with the DCE standards themselves. Microsoft did proceed to create a similar "unique identifier" for distributed object tracking. The Microsoft equivalent is referred to as a globally unique identifier or GUID. It is used in the same way as the original UID and the more contemporary DCE UUID. For all intents and purposes, the GUID

generation scheme is identical to the DCE QUID, depending on the use of a 48-bit Ethernet address as the starting point for the creation of a 128-bit GUID. The GUID is used in Microsoft technology for many purposes including the identification of data files.

85. One of ordinary skill in the art would understand the prior discussion of historical usage of the terms "unique identifier," "globally unique identifier," "universal unique identifier," "unique file identifier," and `unique file handles" has exactly the same context as the patent specification - tracking of data files in a computer system. Moreover, even the `702 patent claim language itself directly supports the notion of tagging and tracking computer files representing compressed multimedia data, and one of ordinary skill in the art in January 1991, reading the term "identification encoder" in light of the '702 patent specification would have understood the invention to be describing computer hardware and software to create alphanumeric identification strings to locate, track, or retrieve data files. The identification codes may be written into the files themselves or into a mapping file or database using computer processors and associated software.

ENABLEMENT OF IDENTIFICATION ENCODER

86. Given the well known nature and pervasive use of the terms "unique identifier," "globally unique identifier," "universal unique identifier," "unique file identifier," "unique file handles" in the computer industry during the 1980s, as well as the numerous references I have provided to algorithms for computer generation of such codes, I am of the opinion that no explicit structure or algorithm needed to be disclosed in the specification of the '702 patent, beyond the disclosure already present in the specification, for one of ordinary skill in the art in January 1991 to be able to make and use an identification encoder which gives items in the compressed data library a unique identification code. This is because, given the state of the art and the fact that an "identification encoder" would be implemented in software or the combination of software and hardware elements, one of skill in the art knowing the

claimed functions of the "identification encoder" and using the description of the "identification encoder" and the "unique identification code" in the specification would be able to convert that function into computer language without difficulty and certainly without undue experimentation.

I declare under penalty of perjury that the foregoing statements are true and correct to the best of my knowledge, and that I executed this declaration on October 20, 2004 at New York, New York.

PETER ALEXANDER, Ph.D.